Our Research Mission

- To develop methodologies for modeling and controlling distributed, self-organized systems
- To develop methodologies for automatic design and optimization of distributed, self-org. systems
- To propose original swarm-intelligent algorithms based on recent findings about animal societies
- To implement realistic simulation tools for distributed, real-time, embedded platforms
- To validate methodologies and simulation tools on different multi-unit platforms (e.g., swarms of robots, networks of sensors and actuators, mixed natural-artificial societies, intelligent vehicles)
- To contribute to the education of a new generation of interdisciplinary system engineers

Recent Work – Poster and Demos (PSE A.01 and -0.11)

Swarm Robotic Inspection of Regular Structures

Keywords: distributed coverage and mapping; microscopic and macroscopic modeling; tracking and performance evaluation; distributed, behavior-based control

Sensor-based simulator  Miniature robots  Modeling predictions vs. simulator

Primary contributor: N. Correll; references: N. Correll and A. Martinoli, ISER-04 and DARS-04

Local Positioning System for Real Robots

Keywords: relative positioning; coordinated movement; GPS-free positioning techniques

Primary contributor: J. Pugh

Collective Hearing with Sensor Networks

Keywords: power-awareness; swarm-intelligent algorithms; collective attention; modeling

Primary contributor: C. Cianci

Realistic Simulator of Intelligent Vehicles

Keywords: intelligent vehicles; driver behavior; distributed control

Primary contributors: L. Epiney, O. Michel

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